The Early Stages of *Aloeides thyra* (L.) (Lep.: Lycaenidae) with Notes on Ant Association, Distribution and General Ecology of the Species

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Summary

An account is given of the early stages (larva and pupa) of the South African Lycaenid butterfly, *Aloeides thyra* (L.), with detailed field observations and reference to ant association. The habits and distribution of this butterfly are considered, and some other members of the genus are referred to incidentally. Hitherto unknown, the larva of *Al. thyra* is described and figured, while a fuller description is given of the pupa than has appeared in any works in the past.

Introduction

Up to the present, very little has been published on the early stages of *Al. thyra,* and nothing concerning the larva of this species, which seems to have remained quite unknown, until very recently.

Trimen (1887) found a pupa of *Al. thyra* near Cape Town under a stone. The pupa has also been found by the late Gowan Clark under stones on Lion's Head as far back as 1906, and some 20 years ago by C. G. C. Dickson in the same locality, also under stones.

A fairly complete account, with some figures, of what was considered to be the life-history of *Al. thyra* has been given by Clark and Dickson (1952), but it must be emphasised that these observations, apart from the reference to the pupa, apply strictly to the subsequently described species *Al. depicta* Tite and Dickson (1968).

New Material

Larvae: Two final instar larvae of *Al. thyra* were found by the first author on 7th October 1972 and 8th September 1973. On both occasions the larvae were situated in small depressions in the soil under stones covering nests of the small, black sugar ant *Acantholepis capensis* Mayr. (Formicidae: Camponotinae). An earlier instar larva was discovered clinging to the underside of a stone covering the nest of the ants in which the second final instar larva was found.

Pupae: Three pupae were found by the authors in two nests of *A. capensis* on 7th October 1972 and the first author collected another two pupae under similar circumstances on 28th October 1972 and 26th September 1973. All material

referred to above was obtained from the same area on the slopes of the Twelve Apostles above Camp's Bay. Another pupa was found on the slopes of Signal Hill above Ocean View Drive, Sea Point, on 27th September 1973. The latter specimen was also associated with *A. capensis* and like most other pupae found by the present authors, was attached to the underside of a rock. The cast skin and head-piece of the larva seem usually to remain in position at the anal end of the pupa and may become partly embedded in the silk spun previously by the larva on the surface of the rock.

The Larvae

The larva, found in 1972, was in the late final instar and, when fully extended decidedly elongated, and narrowing towards the distal end. When first discovered it was 20 mm long under full extension. (The specimen found in 1973 attained a length of 24 mm when fully extended). The colour was greyish-green, with longitudinal reddish-brown lines and two rows of orange patches on the dorsal surface. The colour some days before pupation was dull green, with medio-dorsal darker-green streak and some very poorly defined traces of other longitudinal lines. Apart from very minute specialised setae, rather short black spines were scattered over the body as a whole. Lateral setae on the ridge and at the extremities of the body were largely light-coloured, some darker and in general longer than other setae on the larva.

The tubercles were of the highly specialised form usual in this group and related species and, when extruded from their short spined casings, curved over towards the honey-gland with their long hair-like processes fully extended and spread out, the action of the tubercles being very rapid. The head was very dark greyish or brown-black, the neck-shield inconspicuous against its background and of a greyish tint.

The much smaller, earlier instar larva approximated closely in form, colouring and marking to the final instar as described. The setae were less numerous but longer in proportion to the size of the larva, as might be expected in an earlier instar in this group.

The larva of *Al. thyra* is very close to that of *depicta* T. and D., as figured by Clark and Dickson (1971). The colouring and pattern are very similar in each case. Some differences in detail are apparent in other respects—these including the smaller setae and lenticels on certain parts of the larvae.

Shortly after the larva was put in a glass container it attempted to burrow into the soil but soon discontinued this activity and moved upwards against the glass above the soil. The larva made no attempt to feed on fine leaved *Aspalathus* with fresh flowers but wandered about the glass, spinning silk as it went along and resting in a contracted attitude at the upper end of the track of silk. Finally it was placed on top of the *Aspalathus* where it remained without changing its position and, after a few days pupated without any apparent

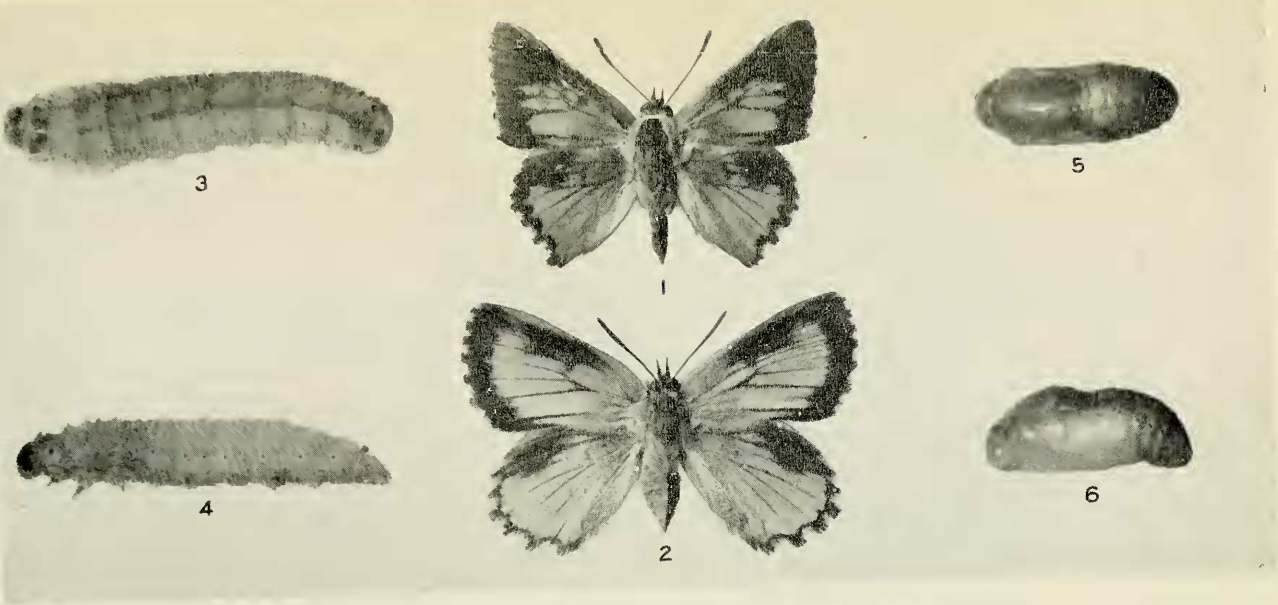

Photo: H. N. Wykeham

Aloeides thyra (L.)

Fig. 1 Imago, ♂ (S. of Hartebeest Kraal, Mamre dist., C. P., 9.xi.71) (×1.5).

Fig. 2 Imago, ♀ (Lion's Head, Cape Town, 27.x.62) (×1.5).

Fig. 3 Larva, late final instar (earlier markings largely lost), dorsal view (×approx. 2).

Fig. 4 Larva, late final instar, lateral view (×approx. 2).

Fig. 5 Pupa, dorsal view (×2).

Fig. 6 Pupa, lateral view (×2).

attachment, on 31st October. The butterfly, a moderately sized female (fore-wing measurement 15.5 mm) emerged on 21st November.

The larva found in 1973 pupated but the imago which became visible through the pupal shell failed to hatch. The smaller larva was seen to feed on *Aspalathus* but died within a few days.

During the first days of its captivity the final instar larva described above was kept under observation together with some specimens of the ant *A. capensis*. The ants were seen running back and forward over the dorsal surface of the larva and whenever an ant arrived at the extended tubercles on segment 11 the latter were suddenly retracted. The purpose of this strange behaviour was not understood and the observations were stopped due to the ants escaping from the container.

Much has been published on the supposed function of the retractile tubercles of the South African Lycaenidae. From the observations on numerous species, the larvae of which possess the highly developed type of tubercles found in *A. thyra*, it has seemed obvious that if ants are too persistent in their efforts to obtain the secretion from the honey-gland, they will be deterred by the action of the tubercles when these come into full play (Clark, 1940; Dickson, 1940; Clark and Dickson. 1956). Clark & Dickson (1956) suggested that the tubercles could perhaps be used in the same way to prevent small insects other than ants from interfering with the honey-gland. Malicky (1969, 1970) suggested that the tubercles of butterfly larvae may be rudimental structures of organs which have no or little function in attracting ants or in deterring them.

The Pupae

The pupa found by the second author in 1972 was 14.25 mm in length, robust in proportion and of a general green colour. The head piece and old larval skin were attached to the anal end. The colour changed gradually and by 24th October was largely amber, but brown in places, especially on the thorax, above the wing cases, and at the anterior end of the pupa. The small spiracles were distinct, under magnification, and dark brown. Very small spines were scattered over much of the surface of the pupa but there were no cremastral hooks. By 27th October the colour of the forewings was apparent through the wing-cases, and a large female (forewing measurement 18.5 mm) emerged just before 8.30 a.m. on 30th October. The wings took an appreciable time to expand, showing little or no increase in size for the first eight minutes and only attaining their full size 20 minutes after emergence. In view of the small size of the host ants and the very narrow exits that suit them, one wonders how the comparatively large butterfly escapes from the ants' nest. The unusually long time taken by the newly emerged imago to complete wing expan-

sion may be part of the answer to this problem. Unfortunately three of the remaining pupae kept under observation were parasitised and another two did not hatch although in both the latter cases the wing pattern of the imago became visible through the pupal skin. The pupa found on 7.x.1972 produced a parasitic fly *Blepharella setigera* Corti (Diptera: Tachinidae).

Note: It must be stated that the illustrations of both the larvae and the pupae represent the advanced phase, in all cases, when the larvae had lost most of the marking as described in the text, prior to pupation, and the pupae had assumed a dull tone.

Distribution and Ecology

True *Al. thyra* appears to be restricted to the South Western Cape, or very nearly so, some of its known localities extending up or near to the West coast for a considerable distance to the North of Cape Town, i.e. at least well beyond Saldanha Bay. The distribution of *Al. thyra* was at one time considered to be much wider, owing to other taxa which have since been separated as distinct species having been included with it.

Al. thyra occurs in various habitats, virtually from the sea shore to considerable elevations in mountainous country. It habitually settles on the ground or on stones, with its wings closed and the underside colouring and pattern rendering it inconspicuous against this background.

The flight period extends from late August or September to April or the early part of May.

Male specimens are as a rule fairly constant in their upperside markings but females may vary noticeably in the development of the dark areas of the upper-side. On the under-side both sexes vary greatly in general ground-colour and in the detailed pattern of the hind-wings—even if the basic pattern of this marking is always present. The ground-colour as a whole, of the underside, may range through shades of grey-brown, warm-brown or reddish-brown to a beautiful wine-colour, this variation occurring in both sexes and apparently being found in almost any locality which is frequented by the species.

The ant *A. capensis* with which the larvae and pupae of *Al. thyra* were found associated are common on the mountain slopes of the Cape and they were abundant on the slopes of the Twelve Apostles above Camp's Bay and on the slopes of Signal Hill above Sea Point where the authors searched for the early stages of *thyra*. The workers of the ant are shiny black and about 4 mm long. The queens, of which usually more than one is present in a nest, are about 6 mm long and of a dull brown colour. The species is without soldiers.

The ants are too small to be able to carry the comparatively large *Al. thyra* larvae into their nests and it may be assumed that the larvae crawl into the nests, guided perhaps